

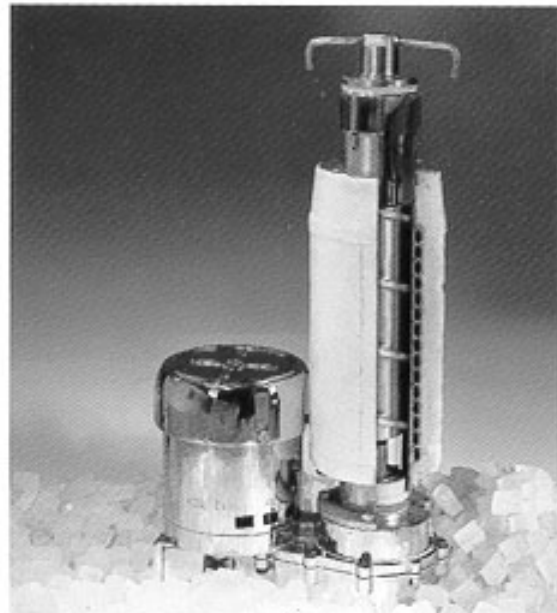


# CORNELIUS ICE MAKERS

## Training Manual



**IMD 600-90**



**Front End Assembly**

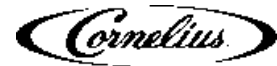
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# CORNELIUS ICE MAKERS TRAINING MANUAL

The products, technical information, and instructions contained in this manual are subject to change without notice. These instructions are not intended to cover all details or variations of the equipment, nor to provide for every possible contingency in the installation, operation or maintenance of this equipment. This manual assumes that the person(s) working on the equipment have been trained and are skilled in working with electrical, plumbing, pneumatic, and mechanical equipment. It is assumed that appropriate safety precautions are taken and that all local safety and construction requirements are being met, in addition to the information contained in this manual.

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# INTRODUCTION

## PREVIEW QUESTIONS

Check your current knowledge by taking a few minutes to answer the following questions:

1. How many thrust bearings are in each IMD/WCC/WCF unit?

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2. How many manual reset overloads are in each IMD/WCC/WCF unit(s)?

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3. What type of water filters should be used on a Wilshire Ice Maker?

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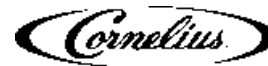
4. What is the difference between Cubed and Extruded Ice Makers?

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## KEY THINGS TO KNOW / DO

- Rotational Freeze is the primary cause of evaporator squealing noises in units.
- What is the proper water level setting.
- How do you adjust low water safety switch.
- How do you adjust ice level switch on IMD Series.
- Why are there vertical grooves (sanding) on the interior wall of the evaporator.
- Water quality is very important!
- Understanding control and safety switches!
- Refrigeration gauges used only when absolutely necessary!
- On the larger IMD units it is important to understand the function of the dispense timer.



## POPULAR APPLICATIONS

Because of their unique form of ice and their extremely compact size, the Cornelius/Wilshire ice maker has a wide range of popular applications. The IMD model line has found wide acceptance in the convenience store market, where it provides a compact package with no need for the counter person to refill the ice bin. The U.S. Navy has found the IMD to be an excellent choice for its on board food service requirements and other applications including hospitals, cafeterias, and nursing stations.

The WCC/WCF series is also being used in restaurants and the meat packing industry. The WCF series has met with success because of the particularly high quality of the flake ice it produces.

Because of the chewable nature of the Chunklet ice produced by the IMD and WCC ice makers, the ice has been very popular with consumers wherever it is available.

## PRINCIPLES OF EXTRUDED ICE MAKING

The Wilshire ice maker creates ice in a process called extrusion. The ice is frozen to an evaporator wall until it grows thick enough to harvest. At that point the ice is shaved from the wall by an auger and carried upward toward the extruding head. The extruding head is a finned device that forms or compresses the ice into its familiar chunklet shape. As the ice is compressed by the head, whatever remaining water there is on the surface of the ice will be squeezed away leaving a uniformly shaped chunk of ice. The ice made in this process is soft and edible, yet resists bridging in ice bins. Automatic agitation circuits in cold plate units or other dispensers should be disabled to prevent the breakdown of the ice.

## FLAKE VS CHUNKLET

The WCC and WCF ice makers are virtually the same machine except for the extruding head and bin control bracket. The primary difference is the amount of compression exerted by the extruding head on the ice. This is comparable to going outside on a snowy day and scooping up a handful of snow. If the snow is tossed into the air without compacting it, it will break apart quickly. If the snow is packed into a ball, it will retain its shape even after striking the ground. The chunklet extruding head in the WCC has a sharp bend at the top of the channel where the ice is formed. As the ice comes to the top of the head it must make a sharp turn outward from the head. This bend causes just enough resistance to the upward flow of the ice to be compacted into a chunklet of ice.

The WCF head bend is very gradual and very little ice compacting occurs. Just enough pressure is applied for any excess water to be extracted to create a fluffy dry form of true flake ice.

Users of the Cornelius Wilshire bin top ice maker are pleased to know that any WCC can be converted into a WCF, or the reverse, in just a few minutes. Simply turn off the ice maker and its water supply, remove the top panel and the top of the auger assembly dispense tray. Pull the auger from the evaporator and disassemble it. Replace the head with the opposite head and restore the parts, power and water supply and manufacture the preferred type of ice.

**NOTE: The IMD Ice Maker/Dispenser cannot be equipped with a flake head. Flake ice will not work in any dispenser.**

## OVERVIEW

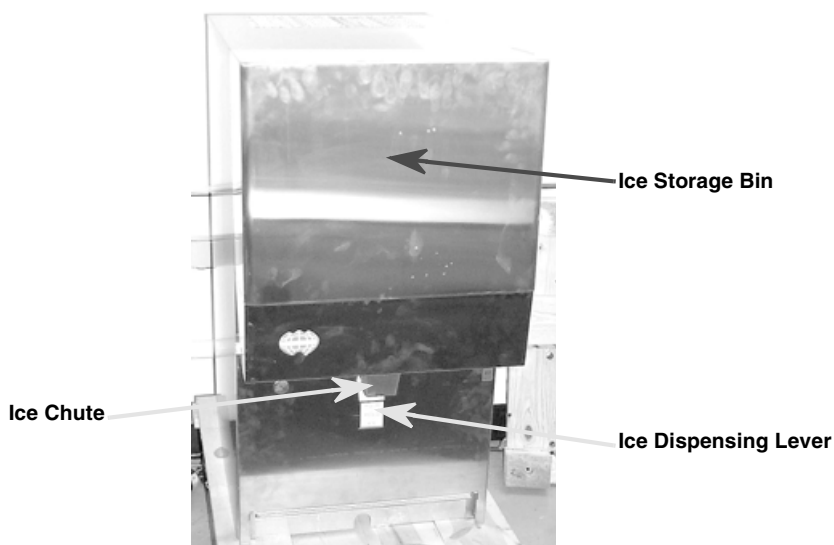


FIGURE 1

## Product Description

Wilshire Ice Makers are available as ice making dispensers, modular chunklet, and modular flaked ice makers.

Wilshire Continuous Chunklet (WCC) and Wilshire Continuous Flake (WCF) ice makers come in three sizes determined by their evaporators inside diameter, (ID). The evaporator's diameter is used as the defining measurement, although the height also increases with an increase in diameter.

<u>Designation</u>	ID
• 500 series	2"
• 700 series	2 ½"
• 1000 series	3 ½"

The designation approximates the maximum possible output of the ice maker in a 24-hour period.

The WCF series of ice makers also includes a dual 3 ½" evaporator model called the WCF 2200.

The ice maker dispenser series (IMD) use the numeric description of maximum ice per day and the bin capacity. For example, the IMD 300-30 makes 300 pounds per day and stores 30 pounds of ice in its bin.

Illuminated merchandisers are optional.



## Dimensions and Capacities

IMD Units available with A/C or W/C condensers, Lever or Push button dispense.

(W. D. H) Inches	Bin Storage	Capacity lbs./24 hrs.	
		70/50	90/70
IMD 300-15, 15 x 24 x 35	13 lbs.	246	202
IMD 300-30, 18.625 x 27.5 x 35.75	30 lbs.	360	301
IMD 302-30, 18.625 x 27.5 x 35.75	30 lbs.	300	250
IMD 600-30, 18.625 x 27.5 x 35.75	30 lbs.	618	493
IMD 600-30, 24 x 29 x 41	90 lbs.	618	493
IMD 601-90, 24 x 29 x 41	90 lbs.	618	493

**NOTE: Health care IMD Units have the same capacity with different dimensions.**

(W. D. H) Inches	Bin Storage	Capacity lbs./24 hrs.	
WCC 500A, 14.5 x 25 x 24.5	n/a	369	285
WCC 500W, 14.5 x 25 x 24.5	n/a	369	285
WCC 501A, 14.5 x 25 x 24.5	n/a	369	285
WCC 700A, 14.5 x 25 x 24.5	n/a	616	513
WCC 700W, 14.5 x 25 x 24.5	n/a	369	513
WCC 701A, 14.5 x 25 x 24.5	n/a	616	513
WCC 701W, 14.5 x 25 x 24.5	n/a	369	513
WCC 700R, 14.5 x 25 x 24.5	n/a	616	513
WCC1001A, W, R, 22 x 24 x 27	n/a	940	748
WCC2001A, W, R, 30 x 24 x 28	n/a	1735	1262

(W. D. H) Inches	Bin Storage	Capacity lbs./24 hrs.	
WCF 510A, W, 14.5 x 25 x 24.5	n/a	442	367
WCF 710A, W, R, 14.5 x 25 x 24.5	n/a	892	702
WCF 711A, W, R, 14.5 x 25 x 24.5	n/a	892	702
WCF1101A, W, R, 22 x 24 x 27	n/a	1426	1134
WCC2001A, W, R, 30 x 25 x 28	n/a	2280	1711



# KEY POINTS — IMD / WCC / WCF ICE MAKERS

## SUPERHEAT & SUCTION TEMPERATURE

Cornelius/Wilshire IMD/WCC/WCF ice makers run at only 4° F superheat. For this reason they are equipped with non-adjustable expansion valves.

Suction temperature should be in the 5 to 8 degree below zero temperature range, regardless of refrigerant type.

## EVAPORATOR SQUEALING

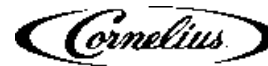
Squealing noises coming from the evaporator always are accompanied by low production. These noises are caused by a “rotational freeze”. A rotational freeze is usually caused by mineral buildup on the evaporator wall. These deposits are not always visible, especially when the evaporator is wet. The production of ice depends on the ice freezing to the wall of the evaporator and being shaved off by the auger.

The evaporator wall is belt sanded to create scratches from top to bottom. These scratches give the ice something to hold onto, preventing it from rotating with the auger. If the grooves become filled with mineral deposits, the ice will not have any grip on the evaporator and begin to rotate, instead of being shaved and pushed upward. The squealing noises are caused by the ice continuing to expand as it rotates.

Ice sticking together in the bin is almost always the result of water chemistry. High concentrates of minerals in the water, chlorine, and salinity are usually found to be the cause. Filters that are specially designed for ice makers usually contain chemicals called phosphates. These phosphates will prevent minerals from freezing into the ice in cubers by keeping the particle in suspension and returning it to the wastewater sump. In the WCC/WCF/IMD ice makers, there is no wastewater; therefore the chemical has nowhere to go except into the ice bin with the ice. Once there, it behaves like salt, causing the ice to breakdown and stick together. This can result in damaged agitator blades or a 200-LB block of ice may be formed in a commercial bin. This effect is less pronounced in the WCF than it is in the WCC or IMD models. **There for phosphate feeders and scale inhibitors should not be used with WCC/WCF or IMD ice makers.**

## Do NOT AGITATE

Due to the slightly irregular shape of chunklet ice, it does not require timed agitation to remain loose. It is an accepted practice to check with the manufacturer of a dispenser before using extruded ice. In some cases, special agitator blades or bin liners may be required. Automatic agitation circuits must be turned off or disabled on any dispenser serving extruded ice. If the agitation circuit is enabled it will cause the ice to breakdown and not dispense properly. Eventually, the agitator blades may be damaged.



## EVAPORATOR EFFICIENCY

The evaporator on the Cornelius/Wilshire ice maker can be tested for efficiency in three easy ways.

1. Simply observe the ice coming out of the extruding head during production. As the auger rotates, an ice chunklet should pop out of each extruder slot on every rotation.
2. Frost pattern testing of the evaporator. Open up the ice maker so that the auger/extruding head can be removed. (This may require waiting until the evaporator has thawed out). Remove the assembly and allow the evaporator to fill with water. Start up the ice maker and allow it to run for exactly one minute and 45 seconds. Immediately shut the unit down, drain the evaporator or use a flashlight to look down into the cylinder. A sleeve or spiral of ice should have formed inside the evaporator tube. This sleeve should extend the full length between the refrigerant inlet and suction outlet lines. There should be no interruptions, gaps or holes in this pattern. There will not be any ice at either end, which are beyond the refrigerant lines.
3. Weighing output. The 24-hour output of the ice maker may be determined by weighing its output of ice for 15 minutes and multiplying that figure by 96. This figure can also be used to calculate water usage. The weight of melted ice (water) must be included in either of the above calculations for accuracy. This test is performed easier on WCC/WCF units than IMDs for obvious reasons. The ice maker should be allowed to run at least 5 minutes before starting the test.

## WATER AND AIR TEMPERATURE

Incoming water temperature and ambient air temperature have a significant effect on ice production. Contrary to a popular misconception, warm water does not freeze faster than cold water. The incoming water temperature has a great effect on ice. Combined with a hot ambient temperature, which makes the condenser less efficient, ice production can be cut back considerably. Inversely, too cold incoming water or ambient air can produce ice which is so hard that the ice maker will groan and squeak. Water and air temperature would have to be at 50° F. or lower for this to occur. If placing an ice maker in a cold environment such as a walk-in cooler, it is advisable to select a model with a remote condenser and to protect the water line from getting too cold.

## IMD Component Identification

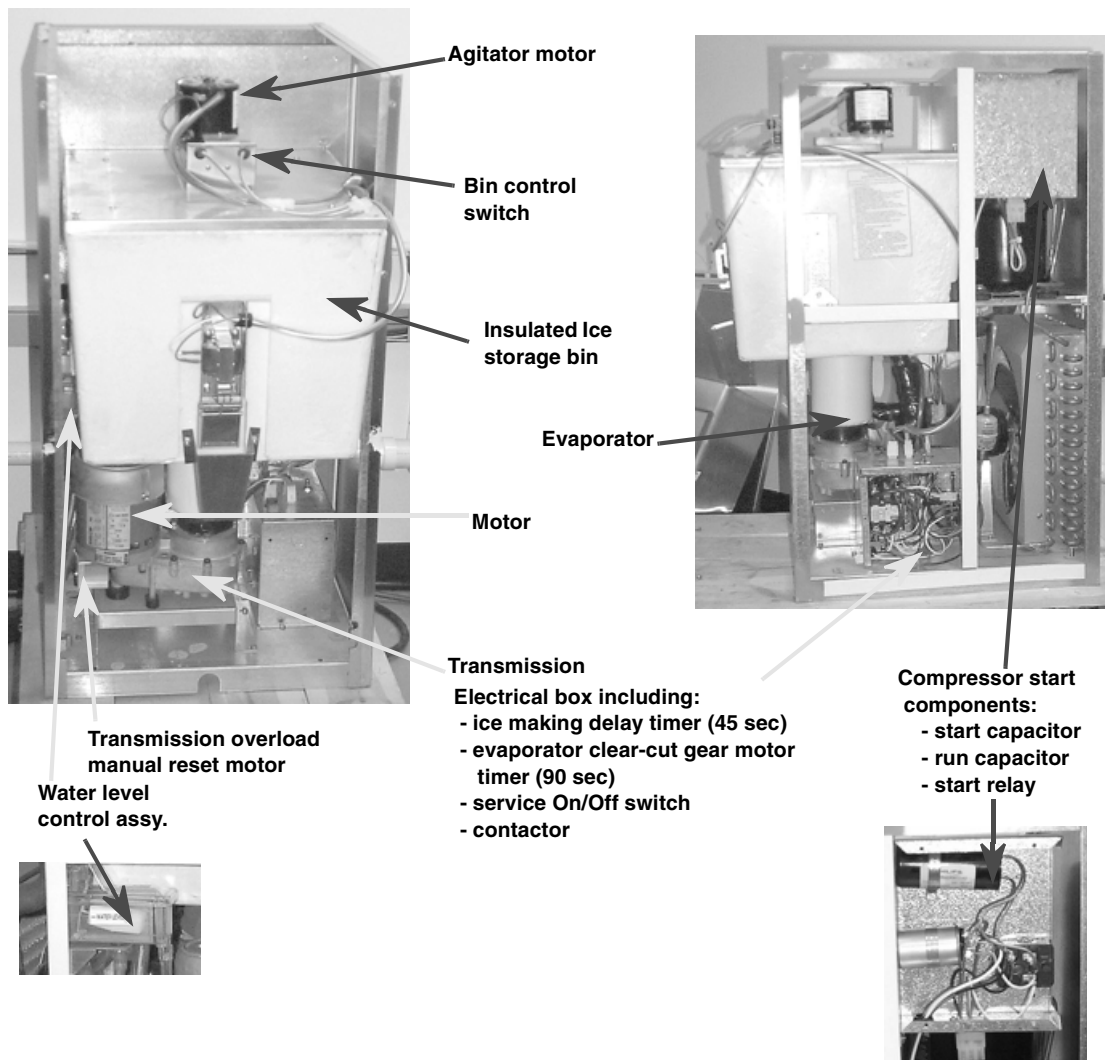


FIGURE 2

## Ice Bin, Agitator, & Cover

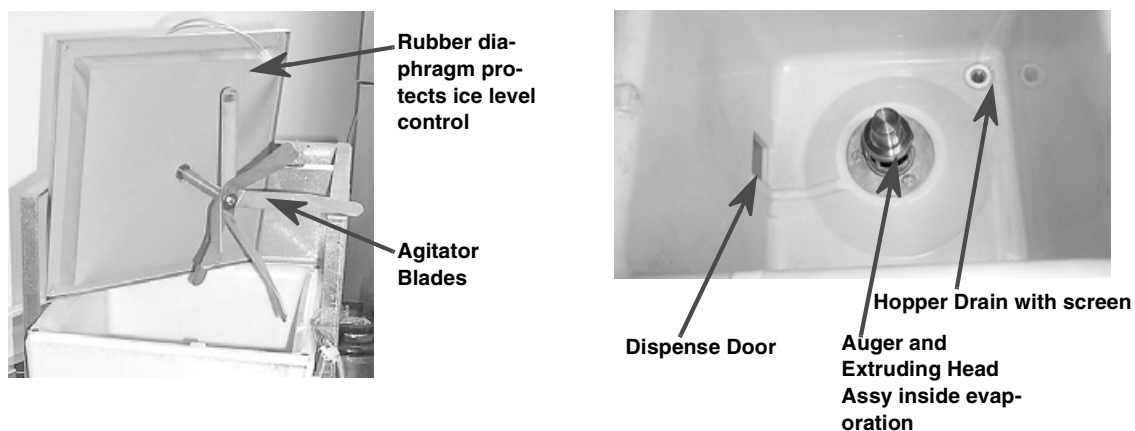
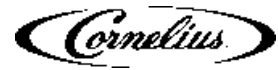


FIGURE 3



## IMD Major Component Detail

Instructor must explain the function of each component.

- Dispense Motor - 115 VAC
- Dispense Solenoid
- Dispense Button
- Dispense Timer
- Bin Switch
- Low Water Safety Switch
- Auger Motor Delay
- Auger Motor
- Compressor
- Compressor Start Components - start capacitor, run capacitor, start relay
- Front End Assembly

## WCC / WCF Component Identification

Instructor must explain the function of each component.

- Front End Assembly
- Evaporator
- Auger
- Extruding Head - bushing
- Gear Motor
- Auger Nut
- Washers - Nylon / Delrin
- Thermal Expansion Valve
- Shaft Seal
- Compressor
- Start Components - start capacitor, run capacitor, start relay

The compressor electrical box contains the compressor start relay, start capacitor, and run capacitors (if necessary).

## Extruder & Evaporator

The extruding head bushing is replaceable. It is a special bushing that contains no lead, and needs to be pressed into the shaft. The thrust bearings will become worn and should be replaced annually or as needed.

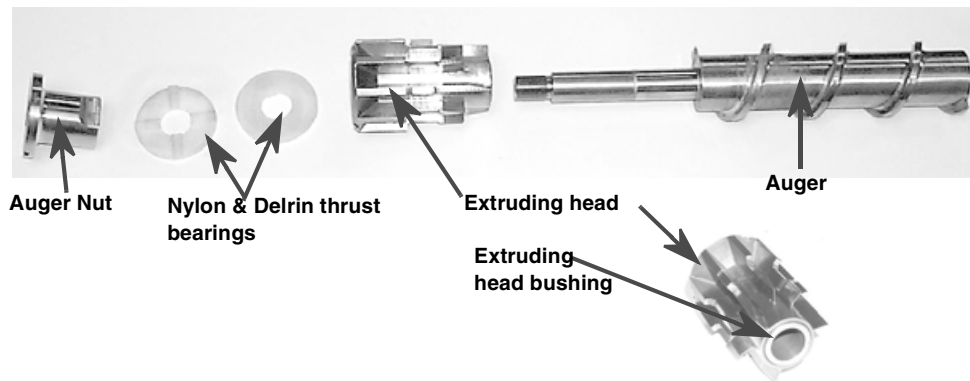


FIGURE 4

The seal between the transmission and the evaporator should be replaced when necessary.

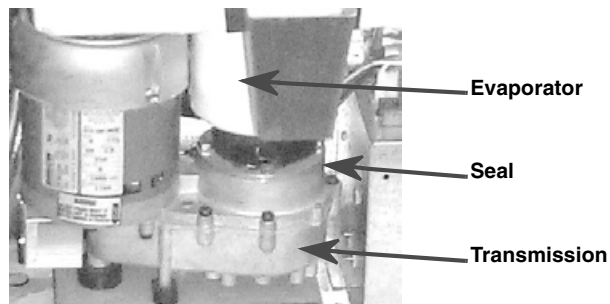


FIGURE 5

**NOTE:** Instructor to point to manual reset overload location.

## SYSTEM DETAILS

### WATER AND FILTRATION

Water quality and proper filtration are important for all ice makers. The correct filter is key to obtaining the best performance from the equipment. **Filters should be of the taste and odor variety only.** Filters that contain scale inhibitors or phosphates will cause chunklet ice to stick together or “bridge” in the bin. This will result in agitator damage. As this type of ice maker uses 100% of the water it takes in, those chemicals will remain in the ice and cause pre-mature melting (bridging) in the storage bin.

Never use softened water. Softened water will cause the ice to stick together in the ice bin and will damage agitator assemblies. Water temperature should be no cooler than 50°F and no higher than 90°F. Warmer water may require pre-chilling for adequate production to be maintained. Water contains dissolved minerals. The measurement of these minerals is referred to as the water TDS. Dissolved solids cannot be removed by normal filtration. Removing these dissolved solids is comparable to trying to remove the sugar from coffee once it has been poured in and stirred. A process called reverse Osmosis is required to remove the dissolved minerals. In the absence of an R.O. System, a good maintenance program can ensure proper performance and longevity from the ice maker.

The water float level should be even with the top refrigeration line in the evaporator.

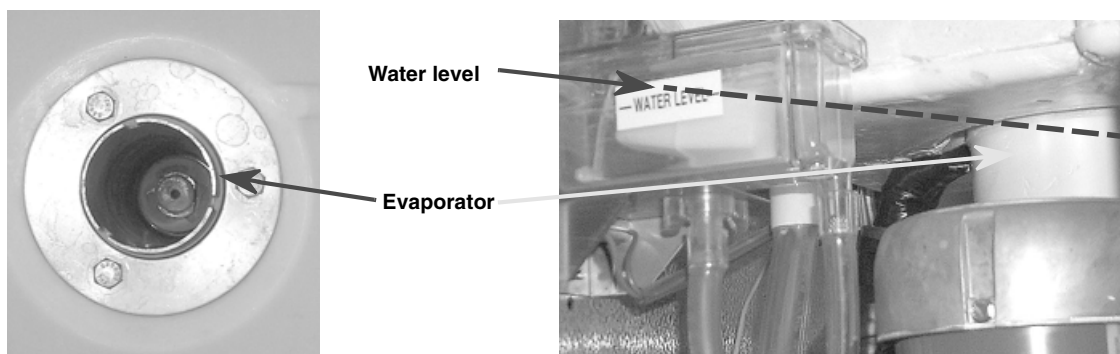


FIGURE 6

### MECHANICAL

The bin top models have a similar component layout, except for the remote units. The interiors of the ice makers are divided in two halves. The back half contains the condensing unit.

The condensing coil is mounted horizontally above the compressor on the 500 and 700 models and vertically behind the compressor on the 1000 series. Both are designed to flow air across the condenser before compressor.

Water-cooled models cool the compressor with a tubular heat exchanger and a small fan that directs air across the compressor.

## REFRIGERATION

### Refrigeration System Operation

The WCC/WCF refrigeration system is a critical charge unit with very low superheat. Therefore, it is important to not hook up refrigeration gauges unless absolutely necessary.

The system works by feeding refrigerant into the evaporator via a non-adjustable expansion valve. The valve is connected at the lower port of the evaporator. The evaporator is constructed by winding a copper evaporator tube around a stainless steel tube. The copper coil is soldered to the stainless tube to improve heat transfer. The entire assembly is foam molded to insulate it.

Once the refrigeration system starts, the refrigerant enters the evaporator and pools in the lower coils where it boils upward through the spiral creating the frost pattern on the inner surface. The refrigerant exits the evaporator into the suction line.

The suction line is insulated immediately after the evaporator to prevent sweating and frost buildup. The suction line is joined to the liquid line to create a heat exchanger that prevents frost-back to the compressor. The A/C and W/C units have no receiver.

The difference between the evaporator inlet and outlet is only 4°F.

If recharging is necessary the system must be purged and charged to nameplate specifications.

### Remote Units

The 1000 and the 700 series remote units are configured and controlled differently.

#### 1000 Series Remote

The 1000 remote has the compressor located indoors and the condenser coil and fan unit located remotely. The fan runs continuously. The only pressure-activated control is the low-pressure cutout, located in the main unit.

This low-pressure suction-side switch is designed to open the control circuit to the contactor and shut the compressor down after the pump-down cycle is complete. It is set to open at 0 psig and close at 20 psig.

The pump-down cycle is started by the opening of the low water reed switch, either of the bin controls, or the manual pump-down switch. Once the circuit is open, the liquid line solenoid closes, trapping refrigerant in the receiver and condenser coil.

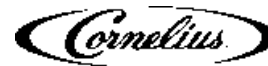
The low-pressure cutout waits for suction pressure to drop to 0.5 psig and opens the control circuit to the compressor, shutting it down.

#### 700 Series Remote

The 700 series remote has the compressor located in the condensing unit. This condensing unit is designated the WCU 600 (115 V) or WCU 601(208-230V). The WCU model is also available as an indoor model for locations where this is desirable.

The 700 series controls its remote via a pump-down solenoid in the main unit and a low-pressure control located in the remote. Once the ice level control (bin thermostat) or a safety control opens the control circuit, the liquid line solenoid closes and the condensing unit pumps the refrigerant back to its receiver.

The suction pressure goes into a vacuum and the low-pressure control in the remote shuts the unit down.

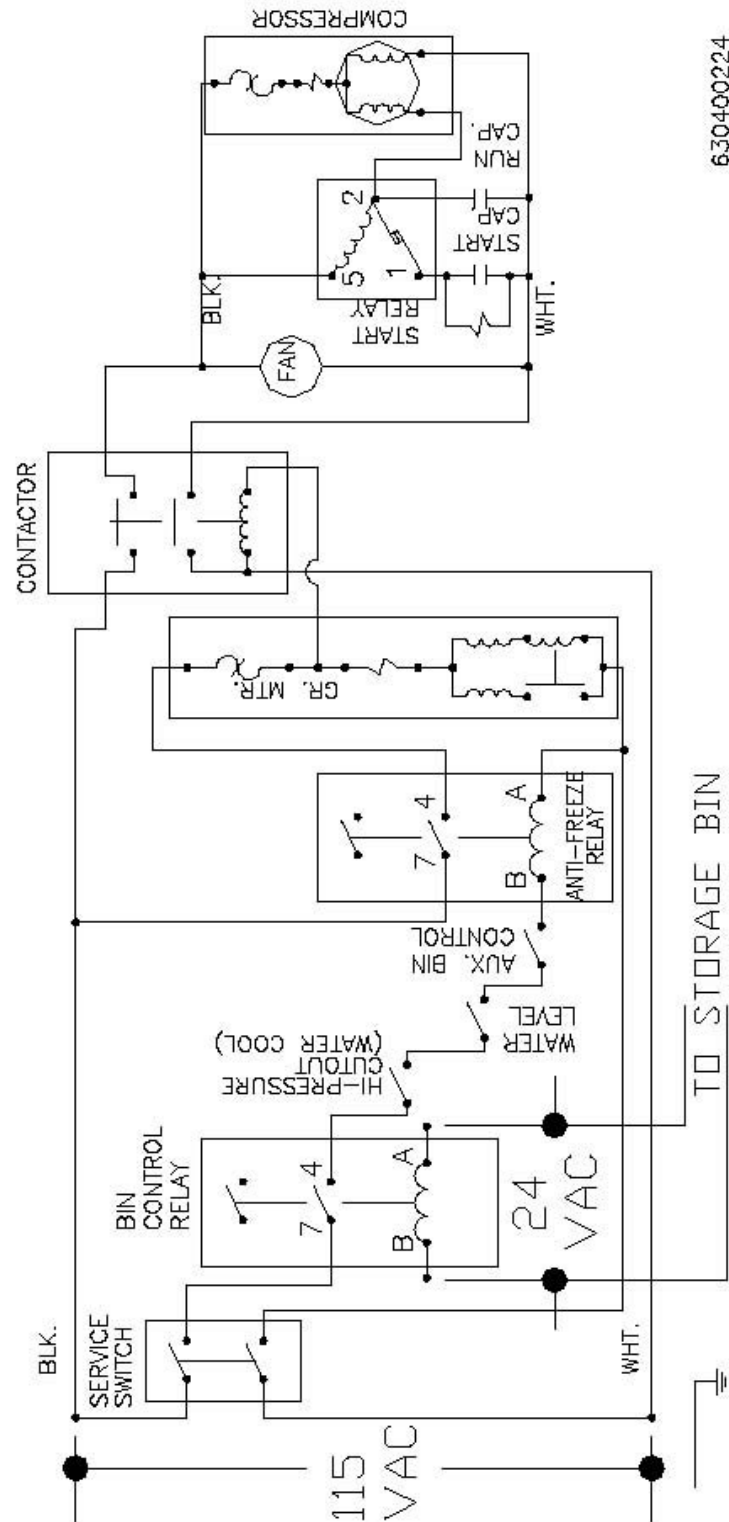


## WCC/WCF CONTROLS AND ELECTRICAL

The WCC/WCF control circuit is a series circuit consisting of the following components:

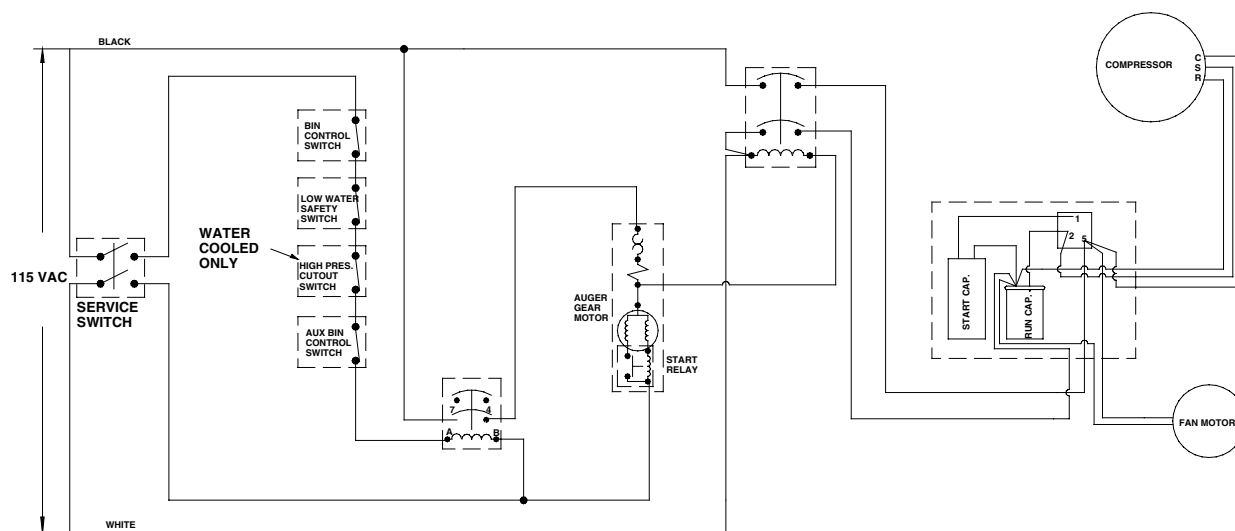
1. **Bin Control** — Electrical power is routed through the primary and the secondary bin controls. The primary bin control is thermostatic, while the secondary is a mechanical switch located in the dispense tray lid.  
The purpose of the secondary switch is to act as a backup in the event of a primary switch failure. If the ice backs up into the drop chute, the control is tripped by the ice accumulation and shuts down the ice maker.
2. **Low Water Safety Switch** — Opens the control circuit in the event of an interruption of the water supply. Once water level is restored in the reservoir, operation will automatically resume.
3. **High-Pressure Cutout** — Water-cooled units have a high-pressure cut-out in the event of failure of the condenser to cool the refrigerant.
4. **Anti-Freeze Relay** — This relay protects the contactor from voltage fluctuations that cause chatter or contact point failure.
5. **Manual Reset Overload** — A manual reset overload under the gearmotor stator shuts down the entire ice maker should the maximum load of the gearmotor be exceeded.
6. **Contactor Coil** — The contactor, once closed runs the refrigeration system and the gearmotor. The ice maker, will continue to make ice without interruption until stopped by the opening of the bin control, or one of the above safety controls.



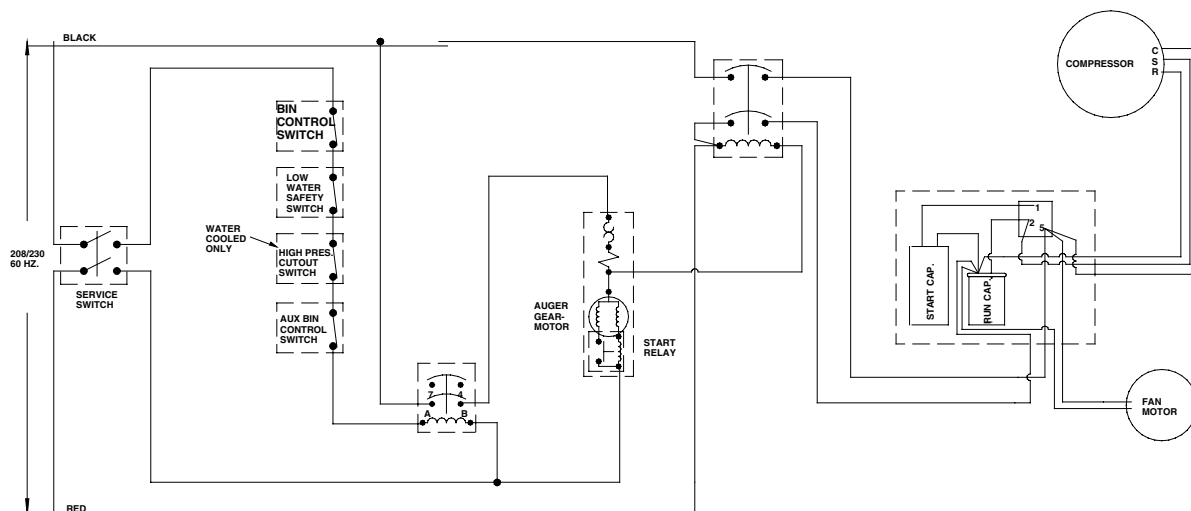


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FIGURE 7. Wiring Diagram



**FIGURE 8. Schematic and Wiring Diagram**  
**WCC500-A, WCC500-W, WCC700-A, WCC700-W, WCF510-A, WCF510-W, & WCF710-W**



**FIGURE 9. Schematic and Wiring Diagram**  
**WCC701-A, WCC701-W, WCC1001-A, WCC1001-W, WCF711-A, WCF711-W, WCF1101-A, & WCF1101-W**

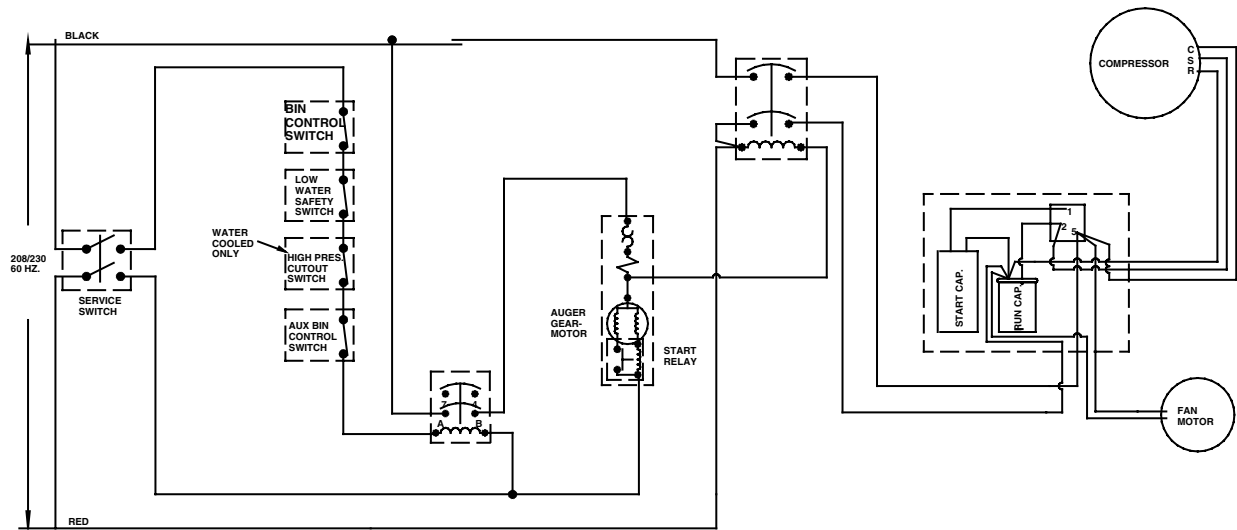


FIGURE 10. Schematic and Wiring Diagram WCF1101-R, WCC1001-R, WCF1102-R, & WCC1102-R

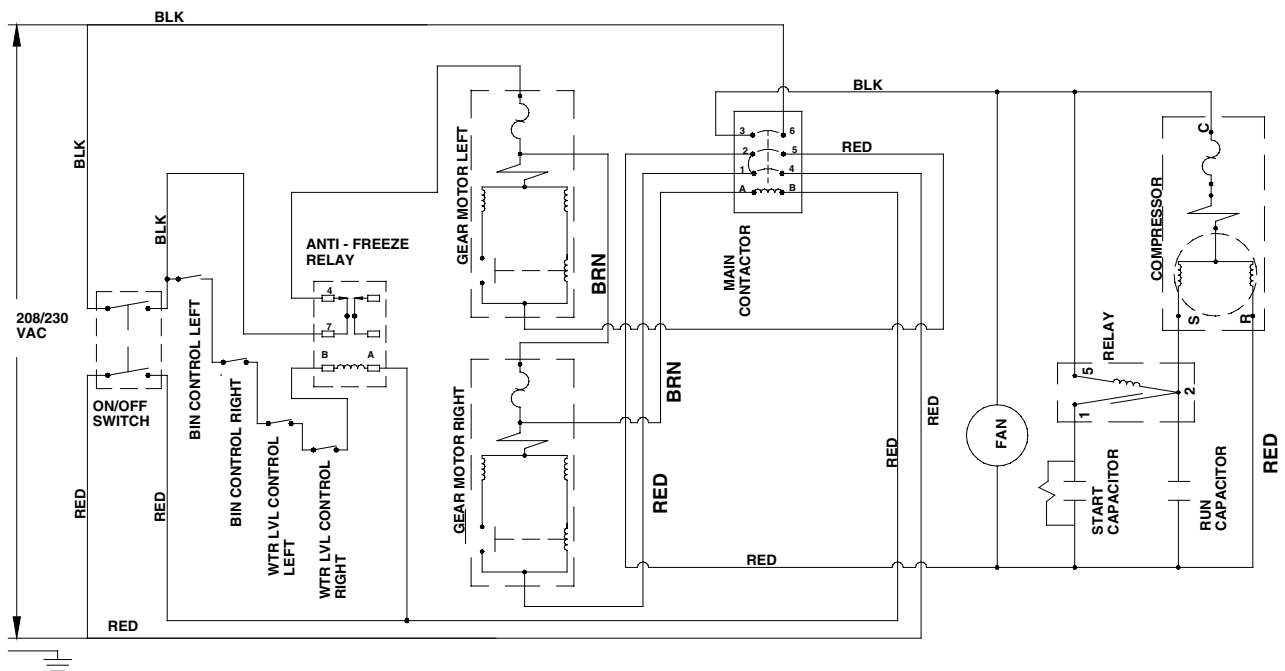


FIGURE 11. Schematic and Wiring Diagram WCC2001-A & WCF2201-A

## IMD CONTROLS AND ELECTRICAL

The IMD series control circuit contains most of the same components used on the WCC/WCF units.

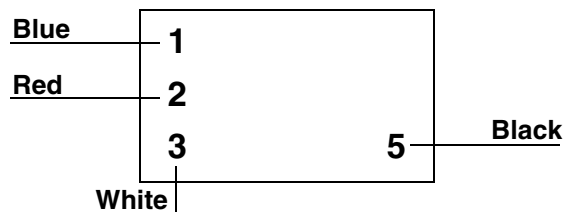
The following components are unique to certain IMD models.

### Illuminated Merchandiser (Optional)

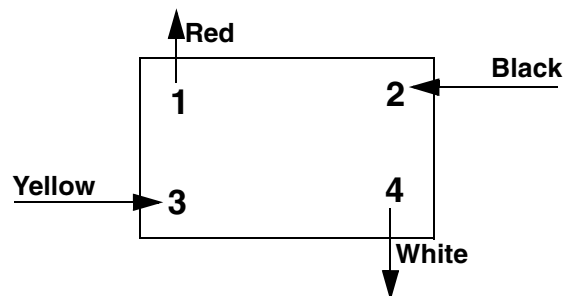
### Key Switch (Optional)

### Drink Front (Optional)

### Auger Delay



### Dispense Timer (Solid State Timer) P/N TE1-24X-31796



### Stand-by Condition

Line voltage is present between black and white wires.

### Timing Condition

Voltage is present between white and yellow only when the ice dispense switch is activated. When accrued dispense time reaches 45 seconds the run condition occurs.

### Run Condition

Line voltage is switched on at the red wire.

### Full Bin Condition

0 voltage between black and white wires.

### Test Procedure

System status - stand-by condition.

1. Connect the meter's ground probe to the white wire.
2. With meter set to read 120 VAC, measure voltage between black and white voltage.
3. Measurement between white and red should be 0 VAC.
4. Measurement between white and yellow should be 0 VAC.
5. Depress the dispense switch and the white / yellow measurement should change from 0 VAC to line voltage.

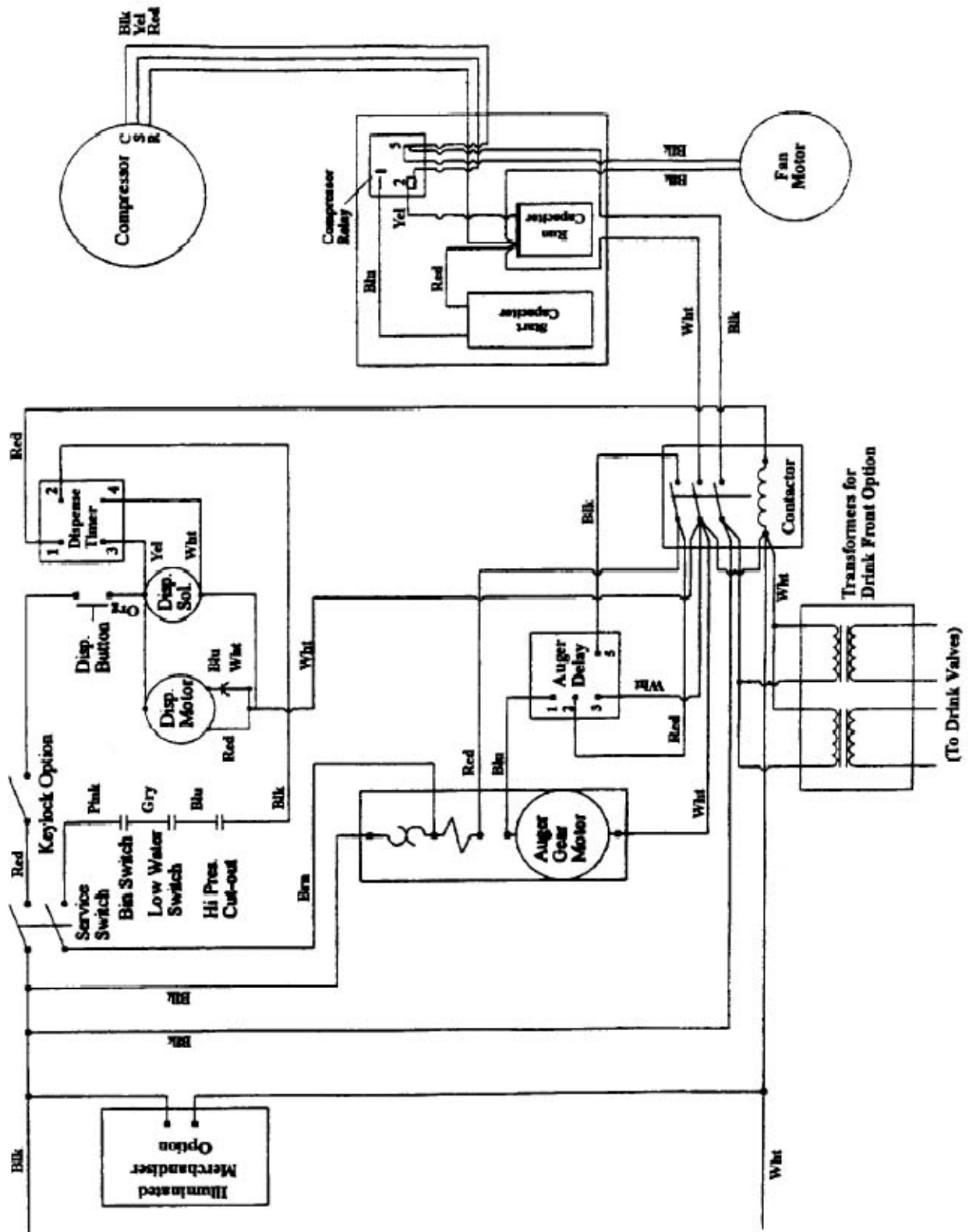
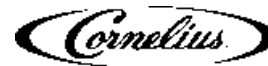


FIGURE 12. Schematic IMD 300-30, IMD600-30, IMD 601-30, IMD600-90, & IMD 601-90



# APPENDICES

## APPENDIX A — INSTALLATION INFORMATION

### Bin / Dispenser Compatibility

For ice bins, merely matching up with the top adapter is all that is required.

Check with the dispenser's manufacturer before installing any ice maker onto a dispenser. The top adapter, special agitator blades or a bin liner might be required. Automatic agitation circuits should be deactivated with extruded ice.

### Site Requirements

There must be proper circulation for intake and exhaust air. Make sure that hot air coming out of the exhaust is not being recirculated to the intake.

### Installation

1. After mounting the ice maker remove the top and side panels.
2. The bin control has a long capillary tube which is wrapped around the thermostat probe holder. At the base of the drop chute there is a screw and washer. These must be removed.
3. Then slide the probe holder down the drop chute and push the end carefully through the rubber grommet in the base of the cabinet. This will place the bin probe directly beneath the drop chute.
4. The screw and washer are then inserted through the loop in the probe holder and screwed back into the hole near the base of the drop chute.
5. Connect the water supply. A carbon or particle filter is recommended. Follow the filter manufacturer's instructions. (Specialized ice maker filters designed for cube type ice makers are **not** recommended.)
6. On water-cooled units, adjust the condenser-modulating valves so that adequate water supply flows to the condenser during operation, but ceases during the compressor off cycle. Filters are not recommended for water flowing to the condenser.
7. Connect the electrical power using flexible conduit. Local codes and the unit data plate should be consulted before choosing cable or fuse/breaker size. Terminate connections inside the electrical box bin control must be checked and adjusted as necessary.
8. Once all hookups are completed, the ice maker can be started.

## APPENDIX B — EVOLUTION OF THE CHUNKLET / FLAKER DESIGN

The Chunklet / Flaker Ice Maker line currently being manufactured by Cornelius in its Mason City, Ia. facility originated in the 1950's as the Reynolds ice maker. The original unit was designed for use exclusively in the post mix vending machine industry. The ice maker has evolved considerably since without losing its original design benefits, compact size, and high output.

### The Spline Drive

The original ice maker utilized the refrigeration system from a vending machine. Soon self-contained models were developed with their own refrigeration systems for use in restaurants, convenience stores, and institutional markets. These early units were available in two sizes, the 2" dia. evaporator, with an output of 300 to 500 lbs. per day, and a 2 ½" evaporator, with a 300 to 700 lbs. output. They were available in 3 cabinet types: a counter top model, a bin-top model and a floor model. The bin top and floor models were available in both flaker and chunklet models.

These early versions of the ice maker, while similar in construction to today's ice maker, were difficult to clean and service. The ice making unit began with a gearmotor. The bottom seal and bearing assembly were bolted onto the output of the gearbox. An auger coupling was held in between the seal and gearbox output. The evaporator was slid onto this assembly and held in place with three lock-tighted bolts. The auger was inserted onto the evaporator and engaged with the coupling. An extruding head was inserted into the top of the evaporator and bolted into place. On top of the extruder, a crescent shaped cutter was used if harder ice was desired.

### The Pin Drive

During the 1980's, ice makers were revised with ease of maintenance in mind. The new ice maker used the same method of making ice, but eliminated the bolt-in extruding head. Instead, the seal assembly was mounted directly on the transmission assembly and held in place by a drive pin. The drive pin eliminated the need for a separate coupling by directly mating the transmission to the auger. The extruding head was re-designed so that instead of being bolted into the top of the evaporator, it sat into three anti-rotation slots. On top of the extruder a white nylon bearing and nut assembly bore the weight of the downward thrust of the auger. These changes allowed the auger assembly to be easily lifted from the evaporator barrel without the use of tools.

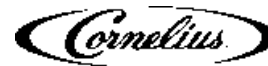
### Current Generation "D" Drive

In 1994, the latest revision of the ice maker was introduced. The D-drive and two-piece thrust-bearing give the ice maker more ease of maintenance and reliability than ever before. Eliminating the drive pin and utilizing the "D" shaped output shaft on the gearmotor, makes the entire assembly more reliable. Surface to surface contact between the auger and gearmotor is increased dramatically. A two piece bearing at the top of the extruding head is much longer lasting.

This generation of ice makers is the first to use environmentally friendly refrigerants.

The D-drive ice maker is available as a counter-top or bin-top model. The counter-top model called the IMD, (Ice Maker Dispenser) is available in two evaporator sizes and three bin capacities. The 2" evaporator is available with the 15 and 30 lbs. bin, and the 2 ½" evaporator comes in the 30 and 90 lbs. sizes. The designation IMD600-30 indicates the Ice Maker Dispenser with a 2 ½" evaporator and a 30 lbs. bin.

The bin-top model line is sub-divided into two categories. First, the chunklet model, designated the WCC (Wilshire Continuous Chunker). The second unit is designated the WCF (Wilshire Continuous Flaker). Bin-top models are available in three evaporator sizes, 2", 2 ½" and 3 ½" sizes. The designations for these models are WCC 500, WCC 700 and WCC 1000. The Flakers are listed as WCF 510, WCF 710 and WCF 1100. An ice maker with dual 3 ½" evaporators has been developed with the designation of WCF 2200.



## APPENDIX C — EVAPORATOR REPLACEMENT

### Procedure for WCC / WCF Ice Makers

1. Disconnect the water and power supply from the ice maker being serviced.
2. Remove the exterior panels, top, front and sides in that order.
3. Attach a gauge manifold set to the system and recover the refrigerant charge. Follow the reclaiming manufacturers instructions for the correct procedure. Access valves are provided on the ice maker.
4. Drain the water from the evaporator by pulling the tube from the bottom center of the float mechanism.
5. Remove the dispense tray cover at the top of the evaporator. Pull the auger assembly from the evaporator and place it in a bucket of ice maker cleaner while finishing the evaporator replacement.
6. Remove the dispense tray assembly from the top of the evaporator by loosening the screw clamp and pulling the tray upwards off of the evaporator.
7. Remove the insulation from the refrigerant lines at the expansion valve, inlet side of the evaporator and the suction line, outlet side of the evaporator, exposing the welds. If dry and undamaged, the insulation can be re-used. Prepare for welding.
8. Protect the expansion valve from excess heat by wrapping it with a cold wet rag or a commercial heat protection product. Heat the joint between the valve and the evaporator inlet until it is hot enough to separate, then pull the expansion valve from the evaporator inlet. Separate the suction line from the evaporator in the same manner.
9. Heat and remove the refrigerant filter dryer from the liquid line. Do not install the new dryer until after the new evaporator is in to prevent moisture saturation of the new dryer.
10. Un-bolt the base of the evaporator from the gearmotor; a 7/16" wrench is required. Lift the evaporator up off of the gearmotor. Gently prying the base upward is sometimes required.
11. Inspect the gearmotor seal assembly for signs of leakage or damage. Repair or replace as necessary. Lubricate the seals rubber ring with a food grade lubricant.
12. Place the new evaporator onto the gearmotor seal assembly. Carefully rotate the evaporator until the refrigerant lines are indexed in the same way as the evaporator just removed. Bolt the evaporator down as before. Applying anti-seize (Loctite Silver Grade Anti-seize #76764) on the bolt threads is recommended.
13. Clean and weld the refrigeration connections using silver brazing solder. Be careful to protect the expansion valve from heat as before. Install the new dryer on the liquid line.
14. Pressure leak testing with dry nitrogen is recommended before charging. Do not exceed nameplate pressure ratings!
15. Evacuate the unit to 500 microns or less and check for signs of pressure rise due to leaks or moisture in the system.
16. Re-charge the system using a refrigerant charging scale or Dial-a-Charge to exact nameplate specifications.
17. Re-assemble the dispense tray assembly, install the cleaned auger assembly and the water feed line to the base of the evaporator. Re-wrap the insulation on the refrigerant lines.
18. Turn on the water supply and check for leaks. See that the evaporator fills to the correct level. Adjust the float if necessary. Make certain that the float shuts off completely once the correct water level has been achieved.
19. Check incoming voltage to the ice maker and be sure it is within nameplate ratings. Restore power and start the ice maker. Check the gearmotor amp draw against its nameplate rating. Refrigerant suction pressure should settle at approximately 28 psig (R464A).
20. Check the condenser for obstruction and replace the exterior panels.

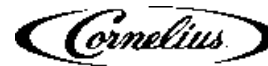


# TROUBLESHOOTING

Top reasons for gear motor overload.

## GEAR MOTOR OVERLOAD CONDITION

1. Is water level set correctly?
2. Is the voltage supplied to the unit within 10% of nameplate specification during run cycle?
3. Is the gear motor amp draw too high during the run cycle?
4. Is the primary bin control and proper mounting bracket installed correctly?
5. Is the secondary bin control operating properly and not causing short cycle?
6. Has a freeze pattern test been performed on the evaporator?
7. Is the unit clean?
8. Has the vertical wall of the evaporator been inspected for proper sand mark condition?
9. What is the condition of the nylon and delrin bearings?
10. Has work been done on the refrigeration system that may have left the unit under or over charged?  
Verify charge.



## REVIEW

DATE: \_\_\_\_\_

NAME: \_\_\_\_\_

LOCATION: \_\_\_\_\_

The following questions summarize important points in this training lesson.

1. What makes the difference between a WCC and a WCF ice maker?

\_\_\_\_\_

2. What is the proper off cycle agitation setting for dispensers using Chunklet ice?

\_\_\_\_\_

3. What effect do scale inhibitors have on Wilshire ice makers?

\_\_\_\_\_

4. What is the purpose of the anti-freeze relay?

\_\_\_\_\_

5. Is it correct to add a small amount of refrigerant?

\_\_\_\_\_

6. What is the primary cause of squealing noises coming from the evaporator?

\_\_\_\_\_

7. What happens when the water supply is interrupted?

\_\_\_\_\_

8. How often should the Nylon and Delrin washer be replaced?

\_\_\_\_\_

9. What is the function of the dispense timer on the larger IMD units?

\_\_\_\_\_

10. What is the difference between evaporator inlet and outlet temperatures?

\_\_\_\_\_

[illegible]





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